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Underground Storage of Natural Gas by Interstate Pipeline Companies for 1980 and Winter 1980-1981

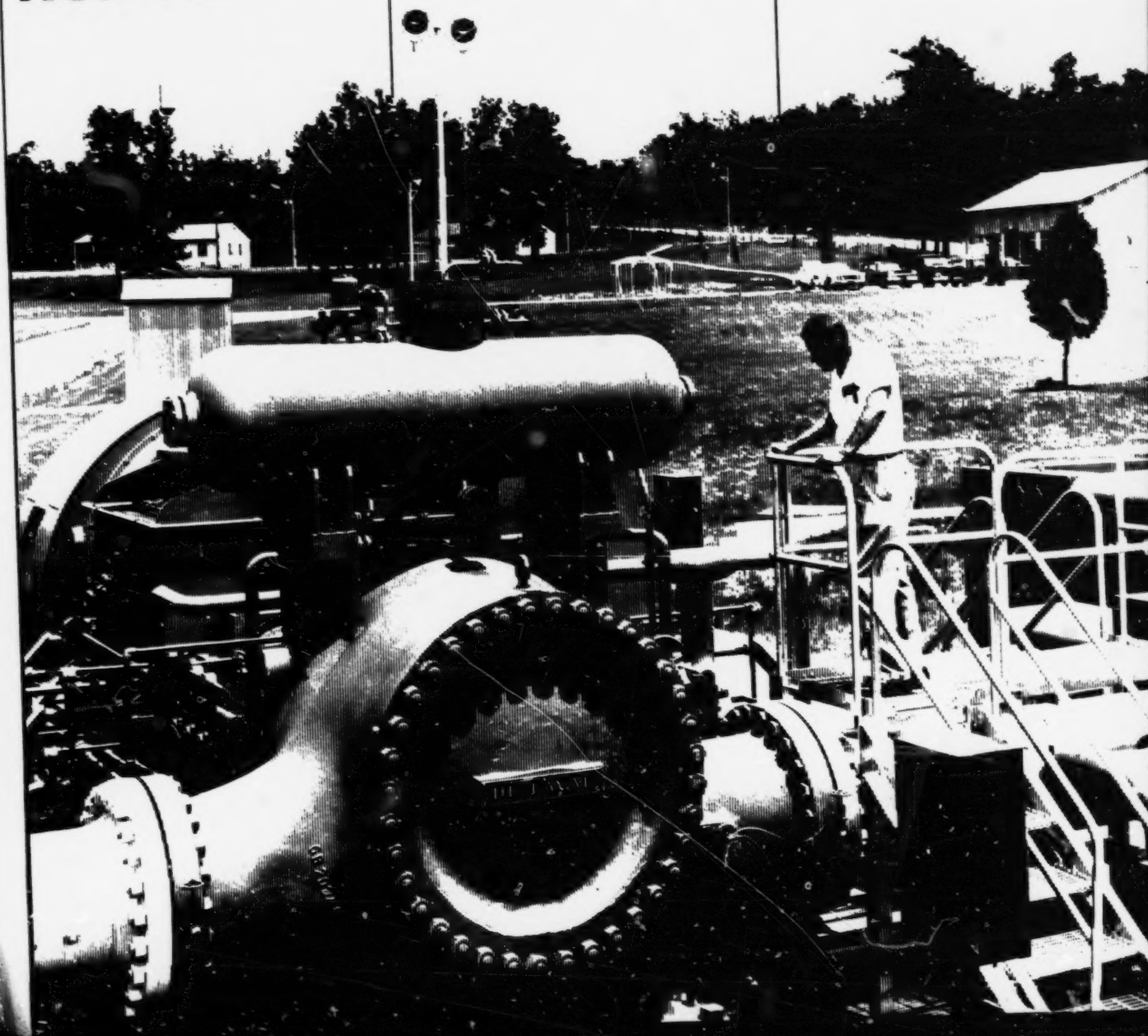
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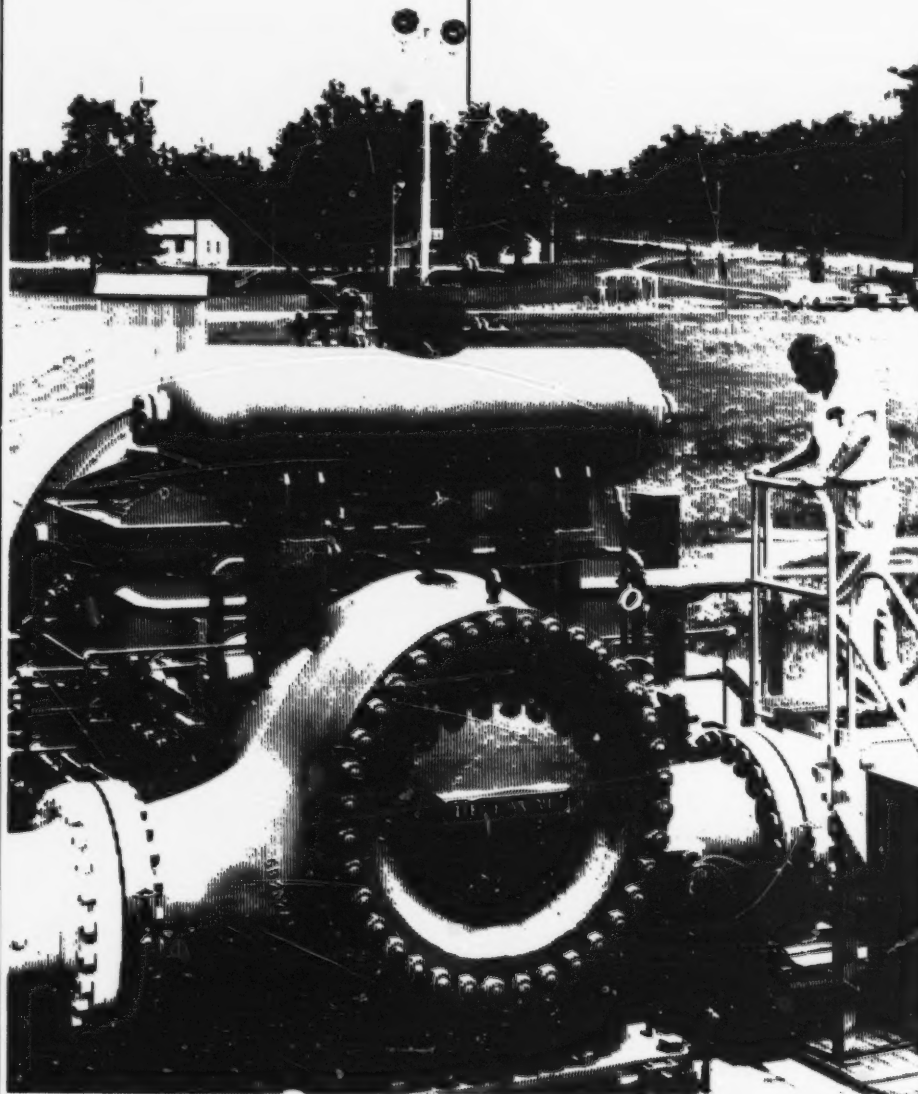
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Energy Information Administration
Office of Oil and Gas
U.S. Department of Energy
Washington, D.C. 20585

Prepared by: Thomas A. Pappas
March 1982



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PREFACE

The purpose of this report, Underground Storage of Natural Gas by Interstate Pipeline Companies for 1980 and Winter 1981, is to present information regarding the underground storage of natural gas for calendar year 1980 by pipeline companies subject to the jurisdiction of the Federal Energy Regulatory Commission (FERC). The source of the data is based on:

1. FERC Form 2, "Annual Report for Natural Gas Companies," filed by 31 interstate pipeline companies
2. Certificates filed with the FERC
3. FPC Form 8, "Underground Gas Storage Report," semi-monthly reports covering the period from November 1, 1980 through March 31, 1981.

This information is provided for the use of the FERC, State utility commissions, other government agencies, and the general public.

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HIGHLIGHTS

Estimated underground storage capacity, as reported in FERC Form 2, "Annual Report for Natural Gas Companies," amounted to 4.4 trillion cubic feet, a 2.2 percent increase over 1979. The utilization of storage gas during the highest consecutive 3-day system peak in the 1980-1981 winter season was 27.6 percent of the total system deliveries during that period, as compared to 30.2 percent in the 1979-1980 winter season. (See Table 1.)

Data from 217 underground storage fields reported by 31 jurisdictional interstate natural gas companies were used in the compilation of Table 1. Honoeye Storage Corporation and Hampshire Gas Company are exempted by the Federal Energy Regulatory Commission (FERC) from filing information on financial data. Because the financial data from these companies are not available, the financial data of only 29 companies with a total of 215 underground storage fields appear on Tables 3 through 5.

During 1980, three new storage fields were put in operation by jurisdictional pipeline companies. Eleven certificates were issued by the FERC for changes in eleven existing storage fields, including seven amendments for previously issued certificates. (See Table 2.)

The 215 underground gas storage fields operated by the 29 jurisdictional companies as of December 31, 1980 consisted of 175 expansion reservoirs, 17 water drive reservoirs, and 23 aquifer reservoirs, as shown in Table 3.¹ Expansion reservoirs are pressure depletion type reservoirs. Water drive reservoirs are depleted gas or oil reservoirs in which the producing mechanism consists primarily of movement of water into the reservoir as the reservoir fluid is produced. Aquifers are reservoirs that originally contained only water.

¹Honoeye Storage Corporation and Hampshire Gas Company each operate one storage field. The two fields are expansion reservoirs.

The average volume of gas injected and withdrawn from storage in 1980 was 1.2 trillion cubic feet, a decrease of 11.9 percent over the average volume injected and withdrawn in 1979. The average cost of storing gas in 1980 was 44.8 cents per thousand cubic feet (Mcf) compared to 33.9 cents per Mcf in 1979, an increase of 32.0 percent. (See Table 3.)

At the end of 1980, there were 392 gas storage fields in operation in 26 states, and 217 of these fields were reported by pipeline companies subject to the jurisdiction of the FERC. At the end of 1979 there were 383 underground gas storage fields located in 26 states, of which 217 were reported under the jurisdiction of the FERC. Liquefied natural gas (LNG) storage projects are not included with the underground storage fields in this report. Figure 1 illustrates the growth in underground gas storage from 1910 to the end of 1980.

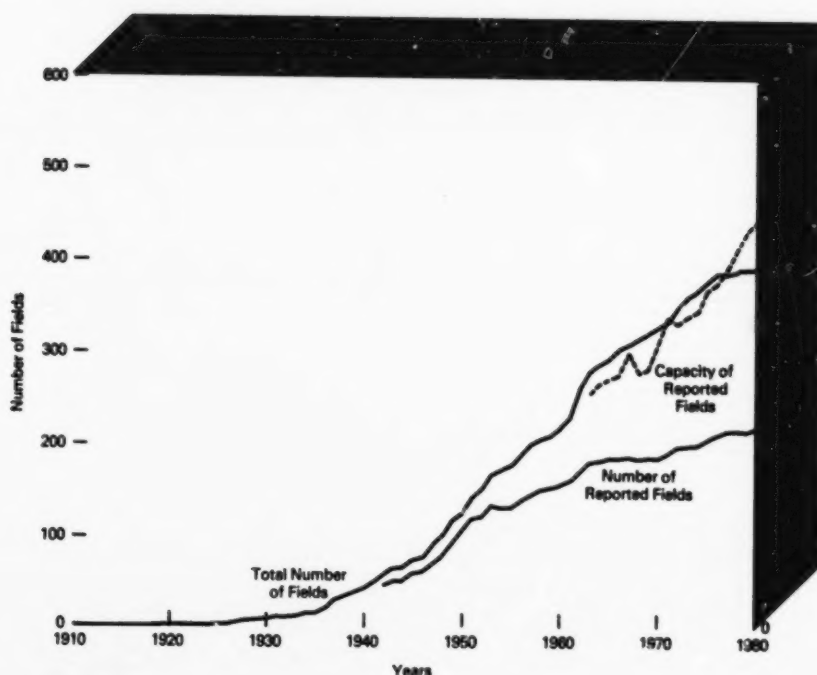


Figure 1. Active Gas Storage Fields in the United States, 1910-1980

**CAPACITY, UTILIZATION, AND CERTIFICATION OF UNDERGROUND
GAS STORAGE FIELDS BY JURISDICTIONAL
PIPELINE COMPANIES IN 1980**

In 1980, the 31 jurisdictional pipeline companies filing Form 2 reported operations of 217 underground natural gas storage fields with a certificated storage capacity of 4.4 trillion cubic feet. This includes both active or top storage gas and cushion or base storage gas, as shown in Table 1.

These storage fields had a maximum deliverability of 31.5 billion cubic feet per day in 1980, as compared to 29.1 billion cubic feet per day in 1979. During the highest consecutive 3-day system peak in the 1980-1981 winter season, the 31 jurisdictional pipeline companies utilized their storage fields to supply 27.6 percent of their total system deliveries, as compared to 30.2 percent in the comparable period of 1979-1980. Total system deliveries during the 3-day period in 1980-1981 increased 1.6 percent over the 3-day period in 1979-1980. (See Table 1.) Figure 2 provides a geographic and historic comparison of the percent of gas from storage during highest consecutive 3-day system peaks for 1963 to 1980.

The FERC issued two certificates in 1980 authorizing the development of underground storage capacity in three new jurisdictional fields of approximately 85 million Mcf at an estimated cost of \$99,546,680. The FERC also issued four certificates and seven amendments to previously issued certificates authorizing additions to ten existing storage fields, as shown in Table 2. These additions increased the deliverability from three of these fields and increased the capacity of five others to 313 million Mcf. The total cost of the additions to the existing fields was \$5,931,448.

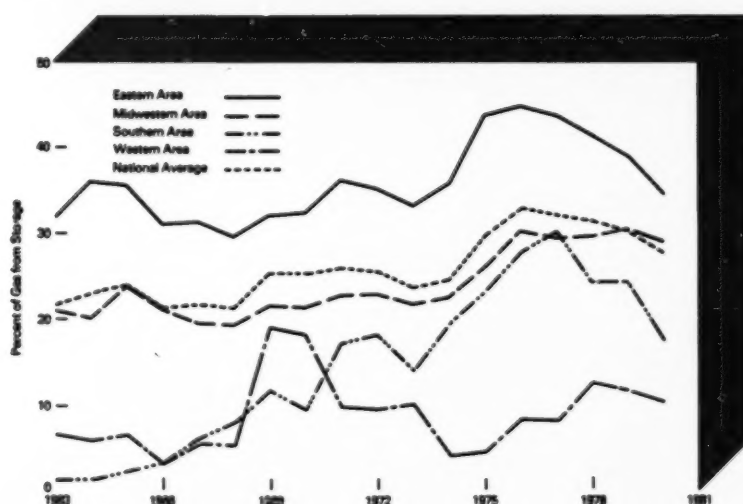


Figure 2. Percent of Gas from Storage During Highest Consecutive 3-Day System Peak by Area, 1963-1980

Table 1. Underground Gas Storage, Deliverability, and Peak Day Use for Jurisdictional Companies as of December 31, 1980
(Volume at 14.73 psia and 60 Degrees Fahrenheit)

Area Of Storage Operations Company	Underground Storage				
	Cushion Or Base Gas MMcf ¹	Active Or Top Gas MMcf	Total Inventory MMcf	Certificated Capacity MMcf	Maximum Deliverability Mcf Per Day
Eastern Area					
Columbia Gas Trans Corp	444,334	118,133	562,467	782,251	4,742,700
Consolidated Gas Supply Corp	204,023	113,949	317,972	473,862	3,987,000
Equitable Gas Company	13,852	32,140	45,992	55,596	307,880
Hampshire Gas Company	9,393	NA	9,393	4,588	249,687
Honeoye Storage Corp	3,028	2,343	5,371	6,300	222,556
National Fuel Gas Supply Corp	66,055	33,006	99,061	107,682	658,720
North Penn Gas Company	7,500	8,087	15,587	21,000	243,000
Tennessee Gas P L Div Tenneco	44,470	23,437	67,907	93,377	936,500
Texas Eastern Trans Corp	98,575	35,105	133,680	166,917	2994,289
Transcontinental Gas P L Corp	98,042	11,561	109,603	217,478	3,551,043
Eastern Area Total	989,272	377,761	1,367,033	1,929,051	15,493,375
Midwestern Area					
Cities Service Gas Co	101,038	40,307	141,345	168,281	1,193,500
Kansas Nebraska Nat Gas Co	32,359	58,942	91,301	71,689	135,000
Michigan Gas Storage Co	71,000	28,057	99,057	117,000	296,187
Michigan Wisconsin P L Co	102,867	143,678	246,545	183,300	1,984,000
Midwestern Gas Trans Co	15,900	3,541	19,441	19,350	46,000
Miss River Trans Corp	54,117	20,067	74,184	74,184	450,000
Natural Gas P L Co of America	156,293	378,396	534,689	534,689	2,194,815
Northern Natural Gas Co	87,089	88,680	175,769	231,330	NA
Panhandle Eastern P L Co	74,557	24,337	98,894	129,600	2,773,044
Texas Gas Trans Corp	88,672	58,057	146,729	168,664	773,190
Union Light Heat and Power Co	550	379	929	980	27,360
Midwestern Area Total	784,442	844,441	1,628,883	1,699,067	9,853,096
Southern Area					
Arkansas Louisiana Gas Co	42,393	12,920	55,313	81,205	608,000
Arkansas Oklahoma Gas Corp	3,321	83	3,404	1,300	12,000
Southern Natural Gas Co	40,820	44,222	85,042	92,820	750,000
Trunkline Gas Company	15,813	2,609	18,422	62,319	23,435
United Gas P L Co	65,524	57,559	123,083	129,050	1,650,000
Southern Area Total	167,871	117,393	285,264	366,694	3,024,435
Western Area					
Colorado Interstate Gas Co	45,449	23,105	68,554	81,088	485,351
El Paso Natural Gas Co	14,600	NA	14,600	25,866	NA
Montana-Sakota Utilities	23,222	129,874	153,096	172,155	2,405,000
Mountain Fuel Supply Co	5,648	7,680	13,320	22,300	221,555
Northwest P L Corp	40,743	29,532	70,275	88,326	NA
Western Area Total	129,654	190,191	319,845	389,735	3,111,906
Total	2,071,239	1,529,786	3,601,025	4,388,547	31,482,812

¹Inclusive of Native Gas.

²Actual Volume in Storage. The Capacity Has Not Been Determined.

³Actual Maximum Delivery for One Day.

NA=Not Available.

Source: FERC Form 2, "Annual Report for Natural Gas Companies."

Highest Consecutive 3-Day System Peak (1980-1981)

Area Of Storage Operations Company	Total System Deliveries Mcf	Volume From Storage Mcf	Percent of Gas From Storage	Dates of Peak
Eastern Area				
Columbia Gas Trans Corp	19,396,362	9,625,999	49.63	02/03-02/05/81
Consolidated Gas Supply Corp	13,308,355	7,967,315	59.87	02/03-02/05/81
Equitable Gas Company	1,822,169	941,280	51.66	01/04-01/06/81
Hampshire Gas Company	NA	NA	NA	NA
Homeoye Storage Corp	NA	NA	NA	NA
National Fuel Gas Supply Corp	3,886,901	1,911,598	49.18	02/03-03/04/81
North Penn Gas Company	433,140	292,543	67.54	01/10-01/12/81
Tennessee Gas P L Div Tennessee	11,594,180	1,404,165	12.11	01/04-01/06/81
Texas Eastern Trans Corp	11,883,560	2,420,943	20.37	01/09-02/11/81
Transcontinental Gas P L Corp	21,307,463	4,237,333	19.89	01/11-01/13/81
Eastern Area Total	83,632,130	28,001,176	34.44	
Midwestern Area				
Cities Service Gas Co	6,120,633	2,340,400	38.24	02/09-02/11/81
Kansas Nebraska Nat Gas Co	1,407,032	282,008	20.04	02/09-02/11/81
Michigan Gas Storage Co	1,586,552	793,597	50.02	01/28-01/30/81
Michigan Wisconsin P L Co	10,784,442	2,845,929	26.39	12/18-12/20/80
Midwestern Gas Trans Co	3,093,112	21,700	.70	12/01-12/03/80
Miss River Trans Corp	2,987,142	755,559	25.29	02/10-02/12/81
Natural Gas P L Co of America	15,292,094	7,093,914	46.39	02/02-02/04/81
Northern Natural Gas Co	10,489,660	2,181,000	20.79	01/08-01/10/81
Panhandle Eastern P L Co	8,087,189	1,186,886	14.68	02/01-02/03/81
Texas Gas Trans Corp	7,563,932	1,984,174	26.23	02/02-02/04/81
Union Light Heat and Power Co	NA	NA	NA	NA
Midwestern Area Total	67,411,788	19,485,167	28.90	
Southern Area				
Arkansas Louisiana Gas Co	4,858,963	1,388,719	28.53	02/10-02/12/81
Arkansas Oklahoma Gas Corp	244,228	11,340	3.85	02/09-02/11/81
Southern Natural Gas Co	6,659,303	1,328,737	19.95	01/10-01/12/81
Frankline Gas Company	5,005,905	116,737	2.33	02/20-02/22/81
United Gas P L Co	14,211,319	2,628,188	18.49	01/11-03/13/81
Southern Area Total	31,029,718	5,393,721	17.38	
Western Area				
Colorado Interstate Gas Co	3,979,929	910,310	22.87	02/09-02/11/81
El Paso Natural Gas Co	10,566,074	NA	NA	04/10-04/12/81
Montana-Dakota Utilities	980,949	426,924	45.37	02/08-02/10/81
Mountain Fuel Supply Co	21,910	164,375	750.23	02/01-02/03/81
Northwest P L Corp	4,492,798	582,284	12.96	02/10-02/12/81
Western Area Total	20,001,660	2,083,893	10.42	
Total	202,075,296	55,763,957	27.60	

Table 2. Certificated Changes in Jurisdictional Fields in 1980¹
(Volumes at 14.73 Psia and 60 Degrees Fahrenheit)

Docket Number	Fields	Location	Company
<u>New Fields</u>			
CP79-416	Excelsior 6 Cold Springs 31	Michigan Michigan	AMR Storage Co.
CP79-490	Borchers North	Kansas	Southwest Gas Storage Co.
<u>Additions to Existing Fields</u>			
CP70-309 (AMEND)	Tuscola	Illinois	Panhandle Eastern Pipe Line Co.
CP76-235 (AMEND)	North Hopton	Oklahoma	Panhandle Eastern Pipe Line Co.
CP80-247	North Lansing	Texas	Natural Gas Pipeline Co. of America
CP77-282 (AMEND)	Coco "B"	West Virginia	Columbia Gas Transmission Corp.
CP80-296	Pink	West Virginia	Consolidated Gas Supply Corp.
CP80-395	St. Jacob	Illinois	Mississippi River Transmission Corp.
CP74-33 (AMEND)	Washington	Louisiana	Transcontinental Gas Pipe Line Corp.
CP80-299	Lost Creek	West Virginia	Consolidated Gas Supply Corp.
CP75-33 (AMEND)	Chalk Creek	Utah	Mountain Fuel Supply Co.
CP80-31 (AMEND)	Lost Creek	West Virginia	Consolidated Gas Supply Corp.
CP75-110 (AMEND)	Jackson Prairie	Washington	Washington Natural Gas Co.

¹This table was prepared in the Division of Producer Rates and Certificates, Gas Supply Branch of the Federal Energy Regulatory Commission.

-- = Not applicable.

Cost of Facilities (Dollars)	Certificated Reservoir Capacity (Thousand Cubic Feet)	Peak Day Deliverability Mcf Per Day	Remarks
26,586,680	9,075,000 5,734,000	174,000	Development Development
72,960,000	70,100,000	350,000	Development
--	15,000,000	--	Increase Storage Volume
647,000	--	--	Increase Storage Pressure and Add Additional Facilities
--	144,000,000	740,000	Increased Storage Volume and Pressure
1,515,000	--	--	Replacement of 3.3 Miles of Pipeline
370,800	--	--	Recomplete 4 Wells to Observation Wells
1,269,400	--	--	Additional Wells and Facilities
--	120,000,000	--	Increase Storage Volume and Working Gas Volume
486,000	--	--	Recomplete 6 Wells to Observation Wells
--	1,980,000	70,000	Continue Storage Service
1,643,248	--	--	Recondition Seven Wells
--	31,800,000	396,800	Increased Storage Volume and Deliverability

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ESTIMATED COST OF STORING GAS UNDERGROUND IN 1980

In 1980, the average volume injected and withdrawn from the storage fields operated by the jurisdictional pipeline companies amounted to 1,230 trillion cubic feet.² This compares to an average annual volume of 1,396 trillion cubic feet injected and withdrawn in 1979. (See Table 3.) Table 3 and Figure 3 also show the cost of storing gas underground by jurisdictional companies. A comparison of estimated fixed costs and operating and maintenance expenses for 1979 and 1980 is shown in Table 4. Figure 4 shows the cost of storing gas and the percent of storage capacity used for the years 1963-1980.

The average cost of storing natural gas underground in 1980 for the 29 jurisdictional pipeline companies was 44.8 cents per Mcf. compared to a cost of 33.9 cents per Mcf in 1979. (See Table 5.) The estimated cost of storing gas is composed of the annual fixed cost (rate of return, taxes, and depreciation estimated at a total of 15 percent of the depreciated storage plant investment) and actual storage operating and maintenance expenses. The annual fixed costs are composed of the cost factors listed below which have been used since the inception of this periodic report. At no time has a carrying cost been included in this estimation.

Rate of return	6 percent
Federal income tax	4 percent
Depreciation	3 percent
State income tax, <u>ad valorem</u> , etc.	2 percent
Total	15 percent

² Average injected/withdrawal volumes do not include the gas storage fields operated by Honeoye Storage Corporation and Hampshire Gas Company.

The estimated cost is divided by the average³ annual volume of gas injected and withdrawn from storage to obtain an average cost per Mcf.

Table 6 shows the 1980 gas injections and withdrawals by month. Net injection volumes are also shown; a minus sign preceding the net injection volume indicates that more gas was withdrawn than injected for each month.

³ Sum of the injected and withdrawn volumes divided by two.

Table 3. Estimated Cost to Store Gas Underground by Pipeline Companies in 1980
(Volumes in Thousand Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Area of Storage Operations Company	Number of Fields ¹				Average Volumes Injected and Withdrawn	Depreciated Storage Plant Investment (dollars)	15 Percent of Depreciated Storage Plant Investment (dollars)	Storage Operating and Main- tenance Exp. (dollars)	Total Cost of Storing Gas (dollars)	Cost in Cents Per Mcf
	E	W	A	T						
Eastern Area										
Columbia Gas Trans Corp	51	--	--	51	99,654,960	278,099,404	41,714,911	22,922,001	64,636,912	64.86
Consolidated Gas Supply Corp	13	--	--	13	124,336,077	144,256,440	21,638,466	20,518,951	42,157,417	33.91
Equitable Gas Company	15	--	--	15	20,222,546	30,159,162	4,523,874	3,586,376	8,110,250	40.10
National Fuel Gas Supply Corp	31	--	--	31	42,001,389	40,445,083	6,069,762	6,536,731	12,606,493	30.01
North Penn Gas Company	3	--	--	3	10,909,810	6,457,949	968,692	704,808	1,673,500	15.34
Tennessee Gas P L Div Tenneco	---	--	--	---	58,736,478	27,625,721	4,143,858	4,565,373	8,709,231	14.83
Texas Eastern Trans Corp	1	--	--	1	33,613,280	62,332,461	9,349,869	21,165,040	30,514,909	90.78
Transcontinental Gas P L Corp	3	--	--	3	15,660,594	133,060,951	19,959,143	35,407,628	55,366,771	353.54
Eastern Area Total	117	--	--	117	405,135,234	722,457,171	108,368,575	115,406,908	223,775,483	55.23
Midwestern Area										
Cities Service Gas Co	10	--	--	10	56,430,257	48,758,130	7,313,720	7,143,118	14,456,838	25.62
Kansas Nebraska Nat Gas Co	2	2	--	4	3,848,158	38,609,946	5,791,492	696,423	6,487,915	168.60
Michigan Gas Storage Co	2	--	--	2	32,055,668	7,676,713	1,151,507	1,823,012	2,974,519	9.28
Michigan Wisconsin P L Co	---	12	--	12	127,333,053	150,483,457	22,572,519	34,981,902	57,554,421	45.20
Midwestern Gas Trans Co	---	--	3	3	2,621,491	6,888,697	1,033,305	1,658,281	2,691,586	102.67
Miss River Trans Corp	2	--	1	3	29,160,520	58,126,821	8,719,023	3,260,843	11,979,866	41.08
Natural Gas P L Co of America	3	--	7	10	157,636,154	343,339,073	51,500,861	30,863,448	82,364,309	52.25
Northern Natural Gas Co	---	2	2	4	81,384,646	148,782,204	22,317,331	18,604,457	40,921,788	50.28
Panhandle Eastern P L Co	2	--	3	5	34,927,846	78,144,389	11,721,658	4,296,752	16,018,410	45.86
Texas Gas Trans Corp	8	--	2	10	46,687,214	51,432,621	7,714,893	5,351,968	13,066,861	27.99
Union Light Heat and Power Co	---	--	1	1	70,525	780,436	117,065	137,870	254,935	361.48
Midwestern Area Total	29	16	19	64	572,155,532	933,022,486	139,953,374	108,818,074	248,771,448	43.48
Southern Area										
Arkansas Louisiana Gas Co	3	1	--	4	25,056,215	77,099,281	11,564,892	1,321,078	12,885,970	51.43
Arkansas Oklahoma Gas Corp	1	--	--	1	466,021	58,472	8,771	66,666	75,437	16.19
Southern Natural Gas Co	1	--	--	1	45,149,661	50,897,113	7,634,567	10,678,453	18,313,020	40.56
United Gas P L Co	2	--	--	2	72,583,753	37,621,613	5,643,242	8,656,944	14,300,186	19.70
Southern Area Total	7	1	--	8	143,255,650	165,676,479	24,851,472	20,723,141	45,574,613	31.81
Western Area										
Colorado Interstate Gas Co	4	--	--	4	29,432,800	62,144,068	9,327,610	3,390,964	12,718,574	43.21
El Paso Natural Gas Co	1	--	--	1	1,046,105	2,078,515	311,777	160,886	472,663	43.52
Lone Star Gas Company	12	--	--	12	31,898,708	25,152,891	3,772,934	2,674,035	6,446,969	20.21
Montana-Dakota Utilities	3	--	--	3	18,257,773	52,324,220	7,848,633	344,701	8,193,334	44.88
Mountain Fuel Supply Co	1	--	3	4	4,586,584	493,436	74,015	796,055	870,070	18.97
Northwest P L Corp	1	--	1	2	23,970,402	8,748,976	1,312,346	2,828,774	4,141,120	17.28
Western Area Total	22	--	4	26	109,232,372	150,982,106	22,647,315	10,195,415	32,842,730	30.07
Grand Total	175	17	23	215	1,229,778,788	1,972,138,242	295,820,736	255,143,538	550,964,274	44.80

¹Number of fields by type of reservoir E = Expansion, W = Water Drive, A = Aquifer, T = Total.
Source: FERC Form 2, "Annual Report for Natural Gas Companies."

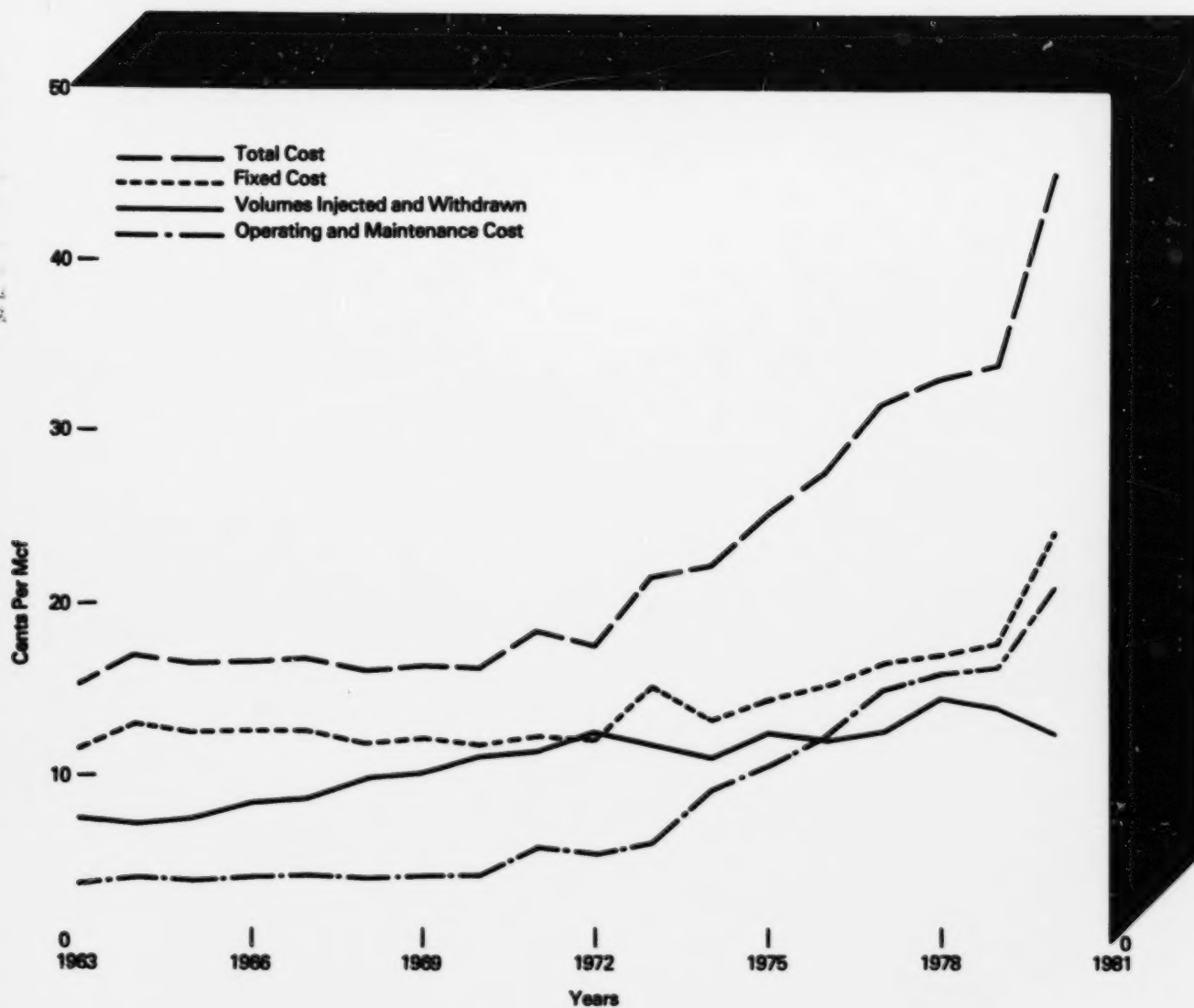


Figure 3. Cost of Storing Gas Underground by Jurisdictional Companies, 1963-1980

Table 4. Fixed Costs and Operating and Maintenance Costs of Storing Gas Underground in 1979-1980
(Costs in Cents Per Mcf of Average Volumes of Gas Injected and Withdrawn)

Area of Storage Operations Company	Fixed Costs		Operating and Maintenance Costs		Total Costs	
	1980	1979	1980	1979	1980	1979
Eastern Area						
Columbia Gas Trans Corp	41.86	17.61	23.00	8.09	64.86	25.70
Consolidated Gas Supply Corp	17.40	16.92	16.50	13.38	33.90	30.30
Equitable Gas Company	22.37	18.34	17.73	12.62	40.10	30.96
National Fuel Gas Supply Corp	14.45	14.87	15.56	13.18	30.01	28.05
North Penn Gas Company	8.88	11.16	6.46	7.92	15.34	19.08
Tennessee Gas P L Div Tenneco	7.05	8.30	7.77	7.52	14.82	15.82
Texas Eastern Trans Corp	27.82	14.42	62.97	32.35	90.79	46.77
Transcontinental Gas P L Corp	127.45	124.03	226.09	263.31	353.54	387.34
Eastern Area Average ¹	26.75	18.32	28.49	17.95	55.24	36.27
Midwestern Area						
Cities Service Gas Co	12.96	10.85	12.66	7.94	25.62	18.79
Kansas Nebraska Nat Gas Co	150.50	61.16	18.10	8.98	168.60	70.14
Michigan Gas Storage Co	3.59	3.43	5.69	5.05	9.28	8.48
Michigan Wisconsin P L Co	17.73	11.30	27.47	26.12	45.20	37.42
Midwestern Gas Trans Co	39.42	36.90	63.26	37.59	102.68	74.49
Miss River Trans Corp	29.50	34.81	11.18	9.93	41.08	44.74
Natural Gas P L Co of America	32.67	15.13	19.58	16.21	52.25	31.34
Northern Natural Gas Co	27.42	26.10	22.86	22.98	50.28	49.08
Panhandle Eastern P L Co	33.56	26.85	12.30	14.26	45.86	41.11
Texas Gas Trans Corp	16.52	14.66	11.46	8.15	27.98	22.81
Union Light Heat and Power Co	165.99	186.59	195.49	48.52	361.48	235.11
Midwestern Area Average ¹	24.46	16.79	19.02	16.63	43.48	33.42
Southern Area						
Arkansas Louisiana Gas Co	46.16	28.90	5.27	4.41	51.43	33.31
Arkansas Oklahoma Gas Corp	1.88	19.04	14.31	8.58	16.19	27.62
Southern Natural Gas Co	16.91	15.01	23.65	14.43	40.56	29.44
United Gas P L Co	7.77	9.11	11.93	7.53	19.70	16.64
Southern Area Average ¹	17.35	14.63	14.47	9.81	31.82	24.44
Western Area						
Colorado Interstate Gas Co	31.69	25.13	11.52	10.11	43.21	35.24
El Paso Natural Gas Co	28.71	10.95	14.81	17.72	43.52	27.77
Loke Star Gas Company	11.83	12.42	8.38	13.97	20.21	26.39
Montana-Dakota Utilities	42.99	23.47	1.89	2.79	44.88	26.26
Mountain Fuel Supply Co	1.61	40.75	17.36	18.79	18.97	59.54
Northwest P L Corp	5.47	33.73	11.80	20.53	17.27	54.26
Western Area Average ¹	20.73	23.36	9.33	13.34	30.06	36.70
National Average ¹	24.05	17.71	20.75	16.24	44.80	33.95

¹Weighted average based on average volumes injected and withdrawn.

Note: Volumes are measured at 14.73 psia and 60 degrees Fahrenheit.

Source: FERC Form 2, "Annual Report for Natural Gas Companies."

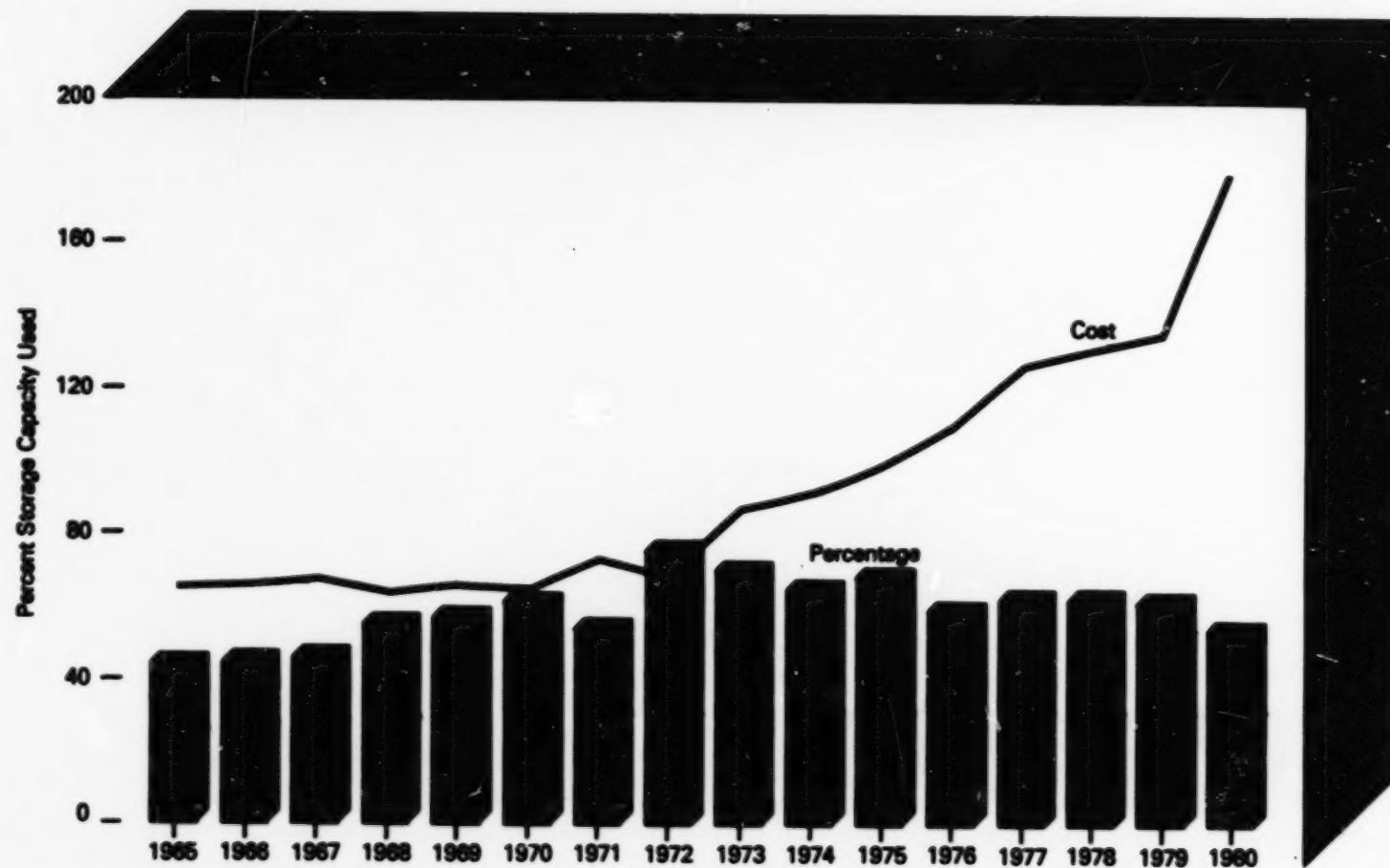


Figure 4. Cost of Storing Gas and Percent of Storage Capacity Used, 1965-1980

Table 5. Changes in Storage Capacity Used and Cost of Storing Gas Underground
(Volumes at 14.73 psia and 60 Degrees Fahrenheit)

Area of Storage Operations Company	Percent Storage Capacity Used			Cost of Storing Gas Underground (Cents per Mcf)		
	1979	1980	Change	1979	1980	Change
Eastern Area						
Columbia Gas Trans Corp	72.06	29.49	-42.57	25.70	64.86	+39.16
Consolidated Gas Supply Corp	47.62	46.08	-1.54	30.30	33.91	+3.61
Equitable Gas Company	58.81	48.45	-10.36	30.96	40.10	+9.14
National Fuel Gas Supply Corp	97.03	100.90	+3.87	28.05	30.01	+1.96
North Penn Gas Company	64.97	80.81	+15.84	19.07	15.34	-3.73
Tennessee Gas P L Div Tenneco	104.18	120.10	+15.92	15.82	14.83	-.99
Texas Eastern Trans Corp	91.01	49.18	-41.83	46.76	90.78	+44.02
Transcontinental Gas P L Corp	11.28	13.11	+1.83	387.33	353.54	-33.79
Eastern Area Average ¹	61.31	43.04	-18.27	36.28	55.23	+18.95
Midwestern Area						
Cities Service Gas Co	79.39	83.92	+4.53	18.79	25.62	+6.83
Kansas Nebraska Nat Gas Co	18.22	9.78	-8.44	70.14	168.60	+98.46
Michigan Gas Storage Co	71.47	69.69	-1.78	8.48	9.28	+.80
Michigan Wisconsin P L Co	170.29	158.31	-11.98	37.42	45.20	+7.78
Midwestern Gas Trans Co	95.57	75.97	-19.60	74.49	102.67	+28.18
Miss River Trans Corp	136.00	98.57	-37.43	44.74	41.08	-3.66
Natural Gas P L Co of America	49.41	41.66	-7.75	31.35	52.25	+20.90
Northern Natural Gas Co	50.70	56.42	+5.72	49.08	50.28	+1.20
Panhandle Eastern P L Co	56.09	63.46	+7.37	41.11	45.86	+4.75
Texas Gas Trans Corp	63.78	58.36	-5.42	22.81	27.99	+5.18
Union Light Heat and Power Co	43.72	16.51	-27.21	235.11	361.48	+126.37
Midwestern Area Average ¹	66.08	61.91	-4.17	33.41	43.48	+10.07
Southern Area						
Arkansas Louisiana Gas Co	55.44	64.56	+9.12	33.31	51.43	+18.12
Arkansas Oklahoma Gas Corp	34.49	23.06	-11.43	27.61	16.19	-11.42
Southern Natural Gas Co	106.68	86.83	-19.85	29.44	40.56	+11.12
United Gas P L Co	95.35	114.26	+18.91	16.64	19.70	+3.06
Southern Area Average ¹	88.32	91.62	+3.30	24.44	31.81	+7.37
Western Area						
Colorado Interstate Gas Co	67.60	82.59	+14.99	35.24	43.21	+7.97
El Paso Natural Gas Co	33.51	9.64	-23.87	27.77	43.52	+15.75
Lone Star Gas Company	217.48	217.04	-.44	26.19	20.21	-6.18
Montana-Dakota Utilities	9.99	12.26	+2.27	26.26	44.88	+18.62
Mountain Fuel Supply Co	25.28	27.53	+2.25	59.54	18.97	-40.57
Northwest P L Corp	48.40	50.38	+1.98	54.26	17.28	-36.98
Western Area Average ¹	37.58	39.75	+2.17	36.71	30.07	-6.64
National Average ¹	62.04	53.55	-8.49	33.94	44.80	+10.86

¹Weighted average based on average volumes injected and withdrawn

Source: FERC Form 2, "Annual Report for Natural Gas Companies."

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Table 6. 1980 Gas Injections and Withdrawals by Month
(Volumes in Million Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Month	Eastern Area			Midwestern Area		
	Injections	Withdrawals	Net Injections	Injections	Withdrawals	Net Injection
January	1,927	65,048	-63,121	7,655	121,561	-113,906
February	1,102	144,226	-143,124	5,458	132,933	-127,475
March	9,613	56,210	-46,597	15,513	83,054	-67,541
April	40,853	18,414	+22,439	35,717	21,002	+14,715
May	91,334	10,002	+81,332	97,211	2,501	+94,710
June	59,397	3,346	+56,051	92,999	1,874	+91,125
July	55,629	5,486	+50,143	82,945	2,132	+80,813
August	56,476	5,078	+51,398	84,016	1,600	+82,416
September	42,969	2,087	+40,882	74,472	1,342	+73,130
October	23,498	15,188	+8,310	37,439	6,329	+31,110
November	17,850	43,773	-25,923	14,083	45,365	-31,282
December	7,409	78,374	-70,965	6,384	114,121	-107,737
Total	408,057	451,232	-43,175	553,892	533,814	+20,078

Month	Southern Area			Western Area		
	Injections	Withdrawals	Net Injections	Injections	Withdrawals	Net Injection
January	2,101	31,045	-28,944	1,306	26,142	-24,836
February	3,808	38,951	-35,143	2,522	15,907	-13,385
March	15,471	18,591	-3,120	2,666	13,480	-10,814
April	14,510	7,063	+7,447	9,823	10,142	-319
May	22,042	793	+21,249	16,177	1,776	+14,401
June	21,447	1,013	+20,434	19,196	3,569	+15,627
July	24,672	1,605	+23,067	18,754	1,949	+16,805
August	22,515	4,201	+18,314	15,212	1,755	+13,457
September	27,375	706	+26,669	16,134	296	+15,838
October	17,742	4,223	+13,519	10,482	1,567	+8,915
November	9,220	23,520	-14,300	6,056	7,385	-1,329
December	4,327	35,022	-30,695	5,075	10,830	-5,755
Total	185,230	166,733	+18,497	123,603	94,798	+28,805

Source: FERC Form 2, "Annual Report for Natural Gas Companies."

WINTER 1980-1981 STORAGE

This portion of the underground storage report summarizes the 1980-1981 winter underground operations of 37 jurisdictional natural gas companies (32 pipeline companies and 5 independent producers) that operate underground natural gas storage fields. The data used are based on information given by these companies on FPC Form 8, "Underground Gas Storage Report," and cover the winter season storage operations from November 2, 1980 through March 31, 1981. These data are partially estimated due to the limited time period (5 days) allowed for reporting data for the monthly and semi-monthly period. They compare starting and closing storage balances for both base (cushion) and working (top storage) gas and list the total storage injections and withdrawals for each company with totals for all companies and for regional groupings of companies.

The following is a summary of comparative statistics for all of the reporting pipeline companies and for the five independent producers.

Table 7 shows that the total working gas (top storage) balance for the reporting pipeline companies at the start of the 1980-1981 heating season was 2,036 billion cubic feet - 9 billion cubic feet more than the previous year. The working gas storage balance at the close of the 1980-1981 heating season was 1,052 billion cubic feet - 127 billion cubic feet (13.7 percent) more than the 1979-1980 season. The decline in working gas for the 1980-1981 heating season was 48.3 percent, as compared with a decline of 54.4 percent during the 1979-1980 season.

Figures 5 through 10 show the trends of the total working gas balance of the pipeline companies for each of the four areas and the total of all the areas for the 1978-1979, 1979-1980, and 1980-1981 seasons.

The starting and closing storage balances, and cumulative injections and withdrawals for the winter heating season for storage fields operated by reporting companies, are shown in Table 8. Table 9 shows the same information for gas in storage owned by reporting companies and includes gas stored in both operated and nonoperated reservoirs.

The five independent producers reported a working gas balance of 109 billion cubic feet at the start of the 1980-1981 heating season - 15 billion cubic feet (16.0 percent) greater than during the previous season. The balance at the close of the heating season was 90 billion cubic feet - 12 billion cubic feet (15.4 percent) greater than during the previous season. The decline in

working gas for the 1980-1981 heating season was 17.4 percent, which is 0.4 percent greater than the 17.0 percent decline during the 1979-1980 season. (See Table 8.)

The working gas balance for all reporting companies (interstate pipeline companies and independent producers) declined from 2,145 billion cubic feet at the start of the winter heating season to 1,142 billion cubic feet at the close of the heating season, a decline of 46.8 percent. (See Table 8.)

Table 8 also shows that the closing base gas balance for all pipeline companies was 99.9 percent of the starting balance, as compared with 101.9 percent for the previous year. The closing base gas balance for the independent producers was 100.0 percent of the starting balance, the same as the previous heating season. Only two companies had closing base gas balances of less than 100 percent. These were Columbia Gas Transmission Corporation and Arkansas Oklahoma Gas Corporation, which had closing base gas balances of 98.7 percent and 99.7 percent, respectively. Since the storage balances for an individual company are composite figures sometimes representing several geographically dispersed storage fields, it is possible for the company to show a substantial end of season working gas balance and also an impairment of base gas.

The independent producers withdrew a total of 31 billion cubic feet from storage during the 1980-1981 heating season, as compared to 30 billion cubic feet during the 1979-1980 heating season, an increase of 3.3 percent. Net withdrawals for the 1980-1981 heating season were 18 billion cubic feet, as compared to 16 billion cubic feet during the 1979-1980 heating season, an increase of 12.5 percent. (See Table 8.)

Total withdrawals of gas from storage for all companies during the winter heating season were 1,279 billion cubic feet, an increase of 2.8 percent from the previous season. Net withdrawals were 1,095 billion cubic feet, an increase of 2.1 percent from the previous year. (See Table 8.)

The total withdrawals from storage by the 32 pipeline companies during the 1980-1981 winter heating season were 1,248 billion cubic feet, as compared with 1,214 billion cubic feet during the 1979-1980 season. A comparison of total withdrawals by area for the last four winter heating seasons (1977-1978, 1978-1979, 1979-1980, and 1980-1981) is shown in Table 10. These total withdrawals do not take into account gas injected during the warm periods of the winter heating season. Taking gas injections into account, the net drawdown of storage balances was 1,077 billion cubic feet for the 1980-1981 winter heating season and 1,056 billion cubic feet for the 1979-1980 season. (See Table 10.) This is an increase of 21 billion cubic feet (2.0 percent).

Table 7. Gas Storage Balance, Pipeline Companies and Independent Producers
(Billion Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Season	Base Gas	Working Gas	Total Inventory
<u>Pipeline Companies</u>			
<u>1978-1979 Winter</u>			
November 1, 1978	2,144	1,923	4,067
April 1, 1979	2,141	755	2,896
Percentage ¹	99.9	39.3	71.2
<u>1979-1980 Winter</u>			
November 1, 1979	2,160	2,027	4,187
April 1, 1980	2,203	925	3,128
Percentage ¹	102.0	45.6	74.7
<u>1980-1981 Winter</u>			
November 1, 1980	2,242	2,036	4,278
April 1, 1981	2,242	1,052	3,294
Percentage ¹	100.0	51.7	76.9
<u>Independent Producers</u>			
<u>1978-1979 Winter</u>			
November 1, 1978	133	74	207
April 1, 1979	133	48	181
Percentage ¹	100.0	69.4	87.4
<u>1979-1980 Winter</u>			
November 1, 1979	132	94	226
April 1, 1980	132	78	210
Percentage ¹	100.0	83.0	92.9
<u>1980-1981 Winter</u>			
November 1, 1980	130	109	239
April 1, 1981	130	90	220
Percentage ¹	100.0	82.6	92

¹Percentage of November 1 volume that remained on the following April 1.

Note: Totals may not equal sum of components due to independent rounding.

Source: FPC Form 8, "Underground Storage Report."

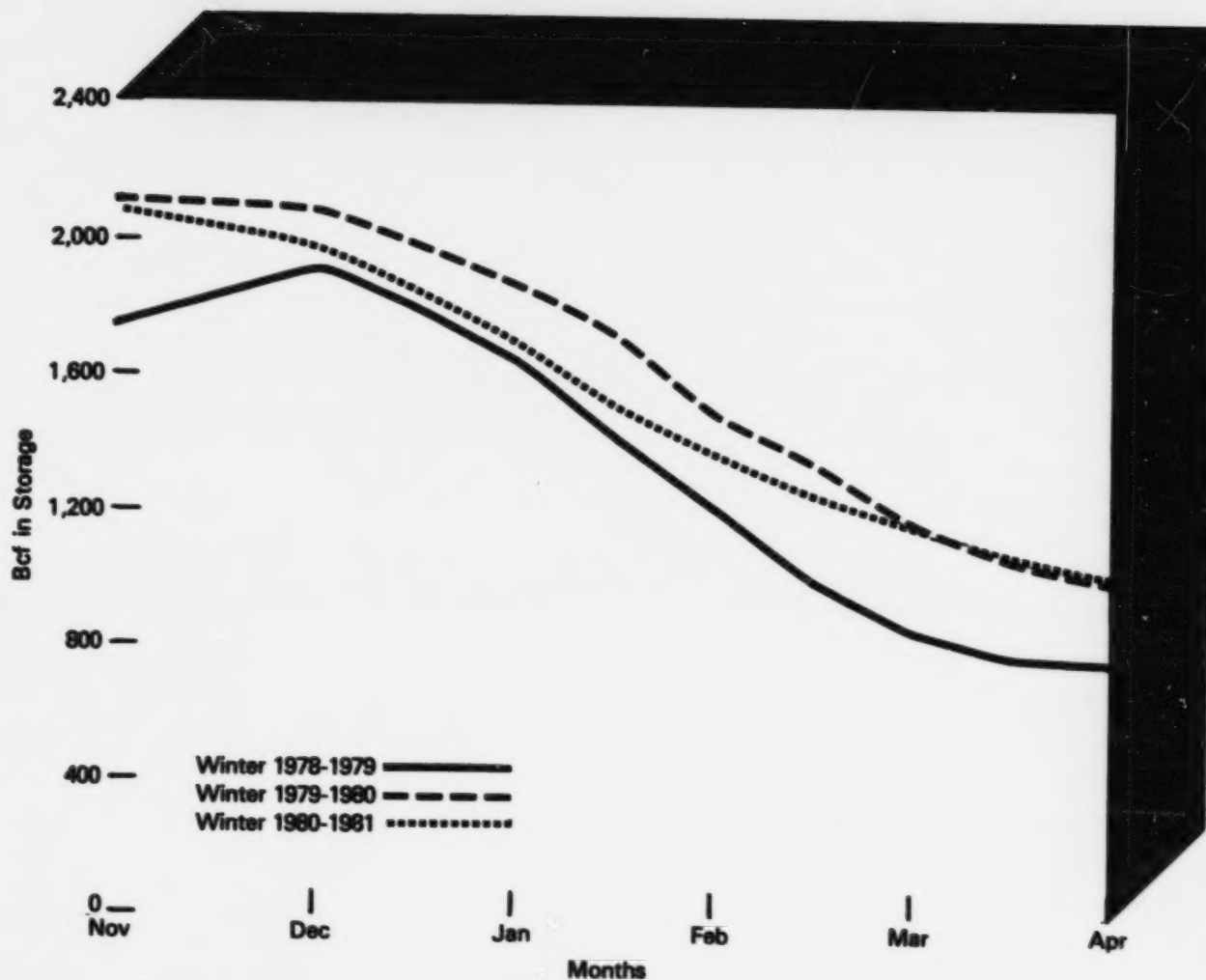


Figure 5. Total All Areas, Monthly Working Gas Balances for Reservoirs Operated by Pipeline Companies

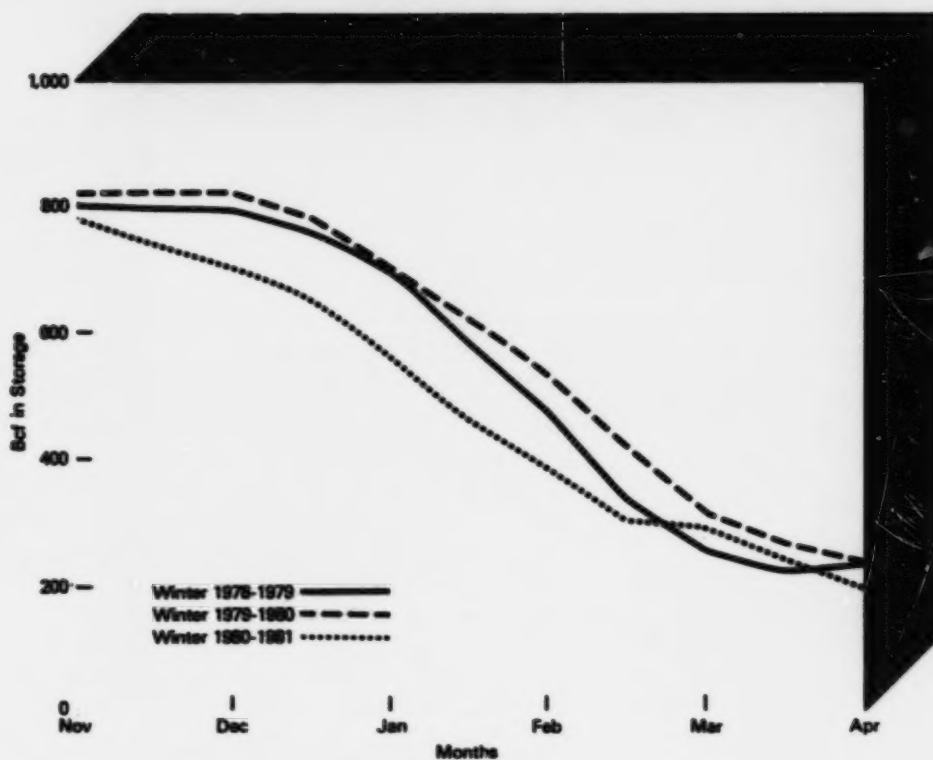


Figure 6. Eastern Area, Monthly Working Gas Balances for Reservoirs Operated by Pipeline Companies

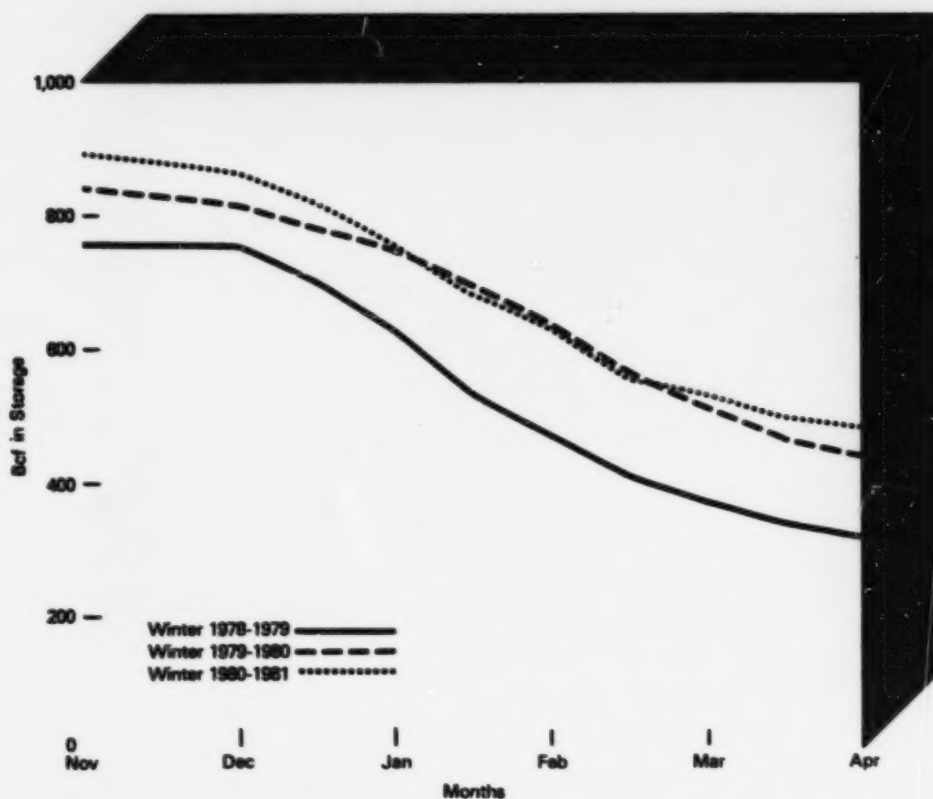


Figure 7. Midwestern Area, Monthly Working Gas Balances for Reservoirs Operated by Pipeline Companies

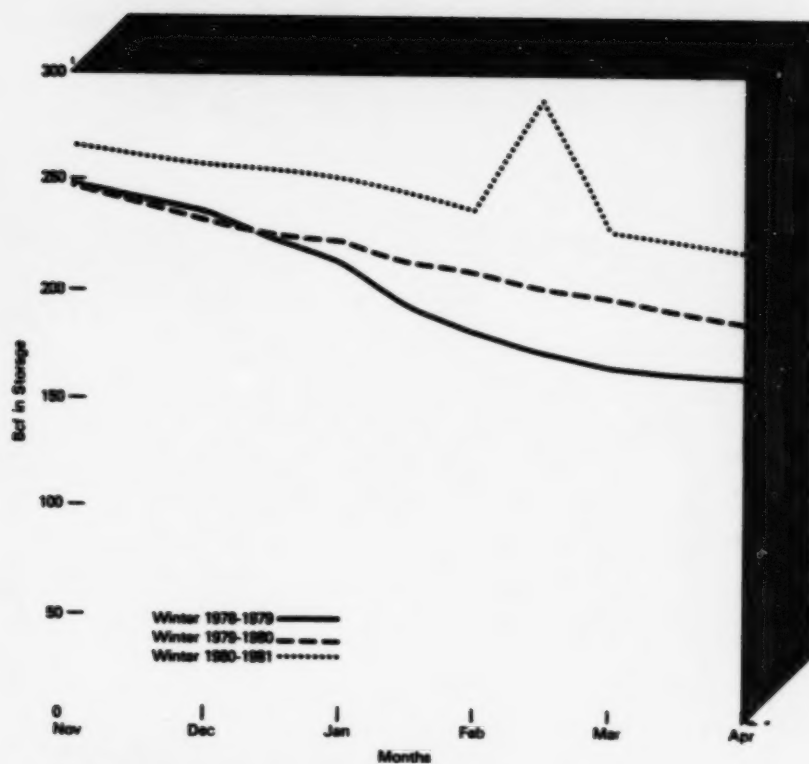


Figure 8. Western Area, Monthly Working Gas Balances for Reservoirs Operated by Pipeline Companies

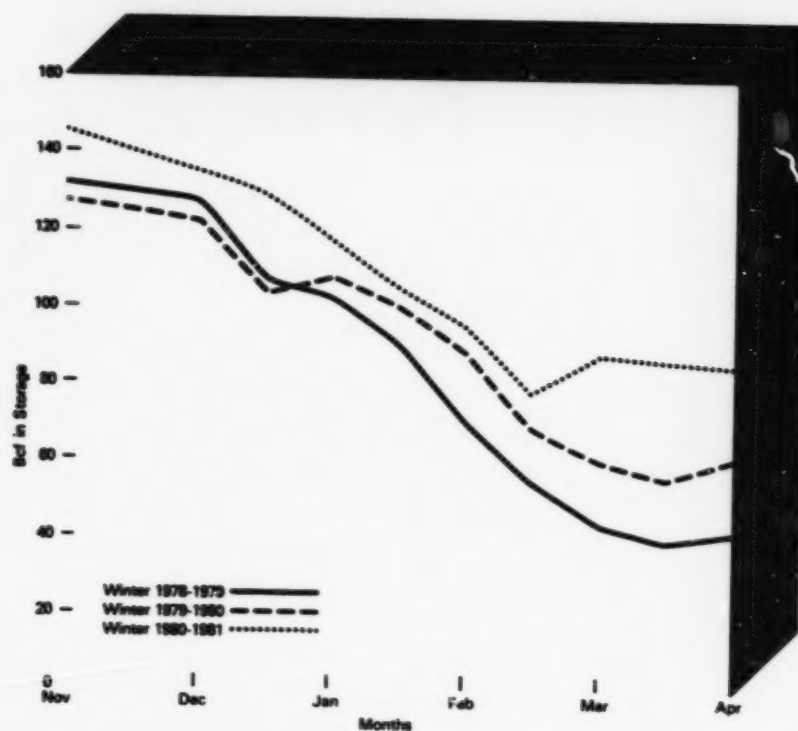


Figure 9. Southern Area, Monthly Working Gas Balances for Reservoirs Operated by Pipeline Companies

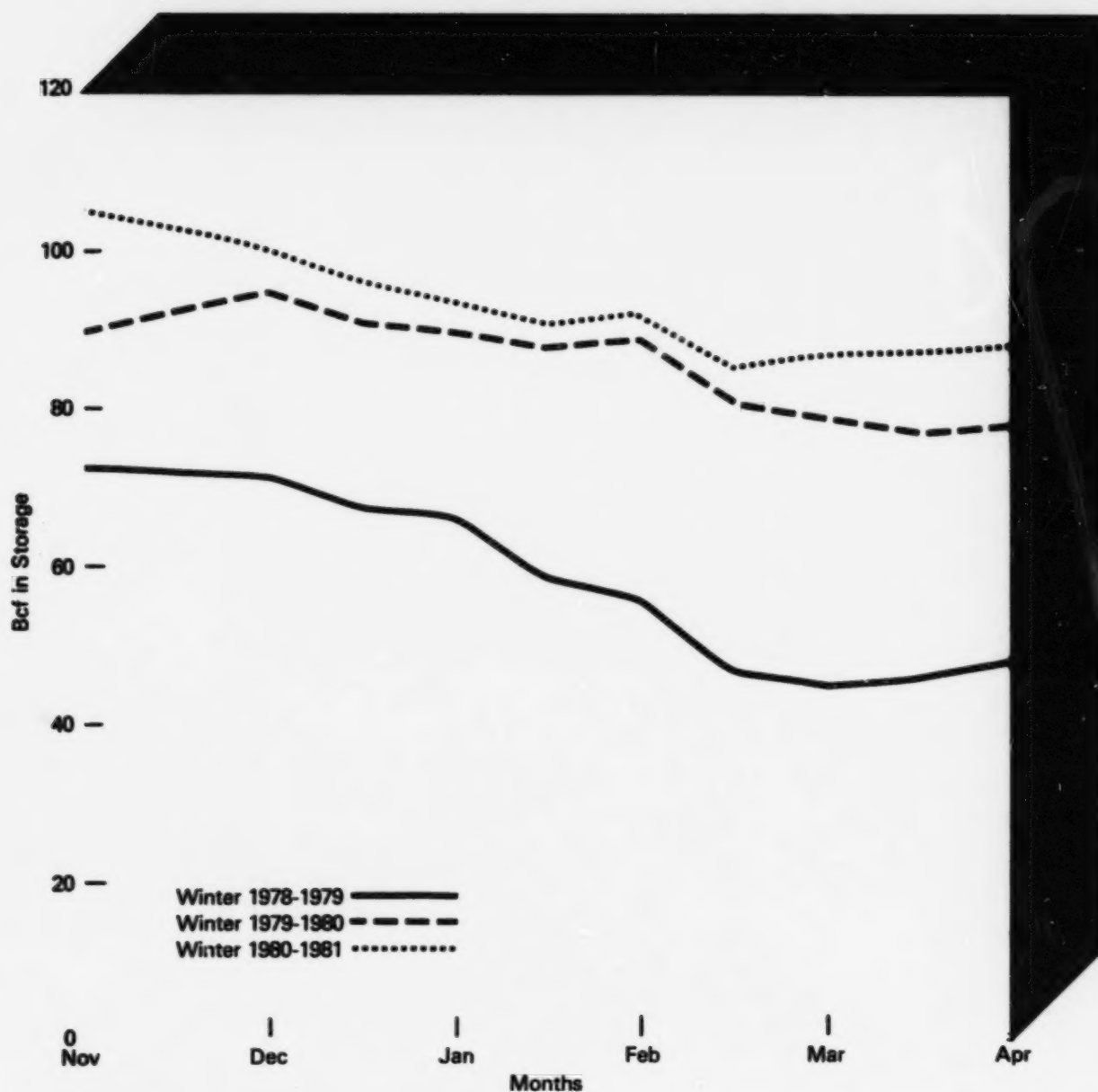


Figure 10. Monthly Working Gas Balances for Reservoirs Operated by Independent Producers

Table 8. Natural Gas in Underground Storage, Injections and Withdrawals, as Reported in FPC Form 8 as of April 1, 1981
Total Gas in Reservoirs Operated by Reporting Companies

(Volume in Million Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Area	Company Name	Base Gas	Working Gas	Total Gas in Storage (Includes Native Gas)	Native Gas Included in Base Gas	Total Gas in Storage (Excludes Native Gas)		Injections	Withdrawals

Eastern Area									
Columbia Gas Trans Corp									
	Balance Nov 1, 1980	850,019	250,640	700,659	79,341	621,318	From Nov 1 To Date	14,981	209,166
	April 1, 1981	844,138	62,060	506,394	79,341	827,053			
	Percent of Nov 1, 1980	98.7	24.8	72.3	100.0	68.7			
Consolidated G Supply Corp ¹									
	Balance Nov 1, 1980	350,935	278,545	629,480	18,876	610,604	From Nov 1 To Date	33,351	249,128
	April 1, 1981	350,935	62,772	413,707	18,876	394,831			
	Percent of Nov 1, 1980	100.0	22.5	65.7	100.0	64.7			
Equitable Gas Co									
	Balance Nov 1, 1980	26,467	25,093	51,560	1,846	49,714	From Nov 1 To Date	1,614	20,820
	April 1, 1981	26,467	5,887	32,354	1,846	30,508			
	Percent of Nov 1, 1980	100.0	23.5	62.8	100.0	61.4			
Hampshire Gas Company									
	Balance Nov 1, 1980	9,393	4,724	14,117	9,393	4,724	From Nov 1 To Date	305	654
	April 1, 1981	9,393	4,375	13,768	9,393	4,375			
	Percent of Nov 1, 1980	100.0	92.6	97.5	100.0	92.6			
Honeye Storage Corp									
	Balance Nov 1, 1980	3,103	2,947	6,050	141	5,909	From Nov 1 To Date	0	1,566
	April 1, 1981	3,103	1,381	4,484	141	4,343			
	Percent of Nov 1, 1980	100.0	46.9	74.1	100.0	73.5			
National Fuel Gas Supply Co ²									
	Balance Nov 1, 1980	96,683	78,899	175,582	12,012	163,570	From Nov 1 To Date	14,228	77,338
	April 1, 1981	96,683	15,792	112,075	12,012	100,463			
	Percent of Nov 1, 1980	100.0	20.0	64.1	100.0	61.4			
North Penn Gas Co									
	Balance Nov 1, 1980	7,500	9,359	16,859	0	16,859	From Nov 1 To Date	0	6,150
	April 1, 1981	7,500	3,209	10,709	0	10,709			
	Percent of Nov 1, 1980	100.0	34.3	63.5	0	63.5			
Texas Eastern Trans Corp									
	Balance Nov 1, 1980	46,677	15,377	62,055	32,456	29,599	From Nov 1 To Date	3,630	17,162
	April 1, 1981	46,677	1,045	48,523	32,456	16,067			
	Percent of Nov 1, 1980	100.0	12.0	78.2	100.0	54.3			
Transcontinental & P L Cor									
	Balance Nov 1, 1980	59,876	89,384	149,260	19,811	129,449	From Nov 1 To Date	2,470	42,695
	April 1, 1981	59,876	49,159	109,034	19,811	89,223			
	Percent of Nov 1, 1980	100.0	55.0	73.0	100.0	68.9			
Eastern Area Total									
	Balance Nov 1, 1980	1,050,633	754,968	1,805,622	173,876	1,631,746	From Nov 1 To Date	70,499	626,671
	April 1, 1981	1,044,968	206,480	1,251,448	173,876	1,077,572			
	Percent of Nov 1, 1980	99.5	27.3	69.3	100.0	66.0			

All footnotes appear at end of table

Table 8. Natural Gas in Underground Storage, Injections and Withdrawals, as Reported in FPC Form 8 as of April 1, 1981
Total Gas in Reservoirs Operated by Reporting Companies --Continued

(Volume in Million Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Area Company Name	Base Gas	Working Gas	Total Gas in Storage (Includes Native Gas)	Native Gas Included in Base Gas	Total Gas in Storage (Excludes Native Gas)		Injections	Withdrawals
Midwestern Area								
Cities Service Gas Co								
Balance Nov 1, 1980	98,488	59,395	153,879	10,812	143,067	From Nov 1		
April 1, 1981	98,488	18,564	113,048	10,812	102,236	To Date	11,706	52,537
Percent of Nov 1, 1980	100.0	31.3	73.5	100.0	71.5			
Kansas Nebraska Nat Gas Co								
Balance Nov 1, 1980	32,359	58,755	91,114	27,805	63,309	From Nov 1		
April 1, 1981	32,359	58,982	91,341	27,805	63,536	To Date	868	641
Percent of Nov 1, 1980	100.0	100.4	100.2	100.0	100.4			
Michigan Gas Storage Co								
Balance Nov 1, 1980	71,000	40,373	111,373	55,500	55,873	From Nov 1		
April 1, 1981	71,000	11,024	82,024	55,500	26,524	To Date	0	29,349
Percent of Nov 1, 1980	100.0	27.3	73.6	100.0	47.5			
Michigan Wis Pipe Line Co								
Balance Nov 1, 1980	102,867	173,657	276,524	53,578	222,946	From Nov 1		
April 1, 1981	102,965	80,433	183,398	53,676	129,722	To Date	328	93,454
Percent of Nov 1, 1980	100.1	46.3	66.3	100.2	58.2			
Midwestern Gas Trans Co								
Balance Nov 1, 1980	15,900	3,816	19,716	0	19,716	From Nov 1		
April 1, 1981	15,900	2,354	18,254	0	18,254	To Date	11	1,473
Percent of Nov 1, 1980	100.0	61.7	92.6	.0	92.6			
Miss River Trans Corp								
Balance Nov 1, 1980	54,080	25,489	79,569	15,803	63,766	From Nov 1		
April 1, 1981	54,080	975	55,055	15,803	39,252	To Date	1,484	25,998
Percent of Nov 1, 1980	100.0	3.8	69.2	100.0	61.6			
Natural Gas P L Co of Amer								
Balance Nov 1, 1980	193,698	365,160	558,858	12,574	546,284	From Nov 1		
April 1, 1981	193,698	261,544	455,241	12,574	442,667	To Date	26,445	130,569
Percent of Nov 1, 1980	100.0	71.6	81.5	100.0	81.0			
Northern Natural Gas Co								
Balance Nov 1, 1980	131,000	55,469	186,469	6,000	180,469	From Nov 1		
April 1, 1981	131,000	4,721	135,721	6,000	129,721	To Date	4,409	55,158
Percent of Nov 1, 1980	100.0	8.5	72.8	100.0	71.9			
Pashandle Eastern P L Co								
Balance Nov 1, 1980	73,850	29,751	103,601	12,062	91,539	From Nov 1		
April 1, 1981	74,863	6,058	80,920	12,062	68,858	To Date	3,321	26,002
Percent of Nov 1, 1980	101.4	20.4	78.1	100.0	75.2			
Texas Gas Transmission Cor								
Balance Nov 1, 1980	88,672	80,254	168,926	72,709	96,217	From Nov 1		
April 1, 1981	88,672	35,440	124,112	72,709	51,403	To Date	5,092	49,986
Percent of Nov 1, 1980	100.0	44.2	73.5	100.0	53.4			
Union Gas System Inc								
Balance Nov 1, 1980	1,019	4,511	5,530	0	5,530	From Nov 1		
April 1, 1981	1,019	3,497	4,516	0	4,516	To Date	13	1,027
Percent of Nov 1, 1980	100.0	77.5	81.7	.0	81.7			
Union Lt Heat and Power Co								
Balance Nov 1, 1980	550	379	929	0	929	From Nov 1		
April 1, 1981	550	380	930	0	930	To Date	19	18
Percent of Nov 1, 1980	100.0	100.3	100.1	.0	100.1			
Midwestern Area Total								
Balance Nov 1, 1980	859,479	897,017	1,756,496	266,843	1,489,653	From Nov 1		
April 1, 1981	860,590	483,972	1,344,560	266,941	1,077,619	To Date	54,196	466,132
Percent of Nov 1, 1980	100.1	54.0	76.5	100.0	72.3			

All footnotes appear at end of table

Table 8. Natural Gas in Underground Storage, Injections and Withdrawals, as Reported in FPC Form 8 as of April 1, 1981
Total Gas in Reservoirs Operated by Reporting Companies --Continued
(Volume in Billion Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Area Company Name	Base Gas	Working Gas	Total Gas in Storage (Includes Native Gas)	Native Gas Included in Base Gas	Total Gas in Storage (Excludes Native Gas)		Injections	Withdrawals
Western Area								
Colo Interstate Gas Co								
Balance Nov 1, 1980	45,489	26,133	71,582	20,729	50,853	From Nov 1 To Date	3,116	21,780
April 1, 1981	45,489	7,470	52,919	20,727	32,192			
Percent of Nov 1, 1980	100.0	28.2	73.9	100.0	63.3			
El Paso Natural Gas Co								
Balance Nov 1, 1980	14,600	0	14,594	11,700	2,894	From Nov 1 To Date	0	0
April 1, 1981	14,600	0	14,594	11,700	2,894			
Percent of Nov 1, 1980	100.0	.0	100.0	100.0	100.0			
Loose Star Gas Co								
Balance Nov 1, 1980	26,731	46,339	73,070	10,403	62,667	From Nov 1 To Date	11,115	19,316
April 1, 1981	26,731	38,138	64,869	10,403	54,466			
Percent of Nov 1, 1980	100.0	82.3	88.0	100.0	86.9			
Montana Dakota Utilities Co								
Balance Nov 1, 1980	23,222	132,337	155,558	23,222	132,336	From Nov 1 To Date	4,012	7,743
April 1, 1981	23,222	128,606	151,828	23,222	128,606			
Percent of Nov 1, 1980	100.0	97.2	97.6	100.0	97.2			
Mountain Fuel Resources								
Balance Nov 1, 1980	45,137	36,796	81,933	9,526	72,407	From Nov 1 To Date	630	4,439
April 1, 1981	45,239	32,885	78,124	9,526	68,598			
Percent of Nov 1, 1980	100.2	89.4	95.4	100.0	98.7			
Mountain Fuel Supply Co								
Balance Nov 1, 1980	5,370	6,406	11,776	0	11,776	From Nov 1 To Date	425	2,968
April 1, 1981	5,370	3,863	9,233	0	9,233			
Percent of Nov 1, 1980	100.0	60.3	78.4	.0	78.4			
Washington Natural Gas Co ²								
Balance Nov 1, 1980	20,900	11,622	32,522	0	32,522	From Nov 1 To Date	966	4,488
April 1, 1981	20,900	8,100	29,000	0	29,000			
Percent of Nov 1, 1980	100.0	69.7	89.2	.0	89.2			
Western Area Total								
Balance Nov 1, 1980	181,409	259,633	441,035	75,588	365,455	From Nov 1 To Date	20,264	60,734
April 1, 1981	181,511	219,062	400,567	75,578	324,989			
Percent of Nov 1, 1980	100.1	84.6	90.8	100.0	88.9			

All footnotes appear at end of table

Table 8. Natural Gas in Underground Storage, Injections and Withdrawals, as Reported in FPC Form 8 as of April 1, 1981
Total Gas in Reservoirs Operated by Reporting Companies--Continued

(Volume in Million Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Area Company Name	Base Gas	Working Gas	Total Gas in Storage (Includes Native Gas)	Native Gas Included in Base Gas	Total Gas in Storage (Excludes Native Gas)		Injections	Withdrawals
Southern Area								
Arkansas Louisiana Gas Co								
Balance Nov 1, 1980	31,774	10,247	42,021	13,932	28,089	From Nov 1		
April 1, 1981	34,449	1,590	36,039	13,932	22,107	To Date	4,621	10,603
Percent of Nov 1, 1980	108.4	15.5	85.8	100.0	78.7			
Arkansas Oklahoma Gas Corp								
Balance Nov 1, 1980	3,321	0	3,321	3,321	0	From Nov 1		
April 1, 1981	3,311	0	3,311	3,311	0	To Date	160	170
Percent of Nov 1, 1980	99.7	.0	99.7	99.7	.0			
Southern Natural Gas Co								
Balance Nov 1, 1980	40,820	51,792	92,612	26,823	65,789	From Nov 1		
April 1, 1981	40,820	27,862	68,682	26,823	41,859	To Date	5,716	29,646
Percent of Nov 1, 1980	100.0	53.8	74.2	100.0	63.6			
United Gas Pipe Line Co*								
Balance Nov 1, 1980	75,024	62,499	137,523	20,500	117,023	From Nov 1		
April 1, 1981	75,024	22,486	97,510	20,500	77,010	To Date	16,280	56,294
Percent of Nov 1, 1980	100.0	36.0	70.9	100.0	65.8			
Southern Area Total								
Balance Nov 1, 1980	150,939	124,538	275,477	64,576	210,901	From Nov 1		
April 1, 1981	153,604	51,938	205,542	64,566	140,976	To Date	26,777	96,713
Percent of Nov 1, 1980	101.8	41.7	74.6	100.0	66.8			
Pipeline Total								
Balance Nov 1, 1980	2,262,480	2,036,156	4,298,636	580,875	3,697,755	From Nov 1		
April 1, 1981	2,240,673	961,452	3,202,117	580,961	2,621,156	To Date	171,736	1,248,250
Percent of Nov 1, 1980	99.9	47.2	74.8	100.0	70.9			

All footnotes appear at end of table

Table 8. Natural Gas in Underground Storage, Injections and Withdrawals, as Reported in FPC Form 8 as of April 1, 1981
Total Gas in Reservoirs Operated by Reporting Companies--Continued
(Volume in Million Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Area Company Name	Base Gas	Working Gas	Total Gas in Storage (Includes Native Gas)	Native Gas Included in Base Gas	Total Gas in Storage (Excludes Native Gas)		Injections	Withdrawals

Independent Producers								
Cabot Corporation								
Balance Nov 1, 1980	2,100	3,990	6,090	143	5,947	From Nov 1 To Date	21	2,936
April 1, 1981	2,100	1,075	3,175	143	3,032			
Percent of Nov 1, 1980	100.0	26.9	52.1	100.0	51.0			
Exxon Corporation								
Balance Nov 1, 1980	34,595	61,399	95,993	34,595	61,398	From Nov 1 To Date	6,520	4,820
April 1, 1981	34,595	63,098	97,693	34,595	63,098			
Percent of Nov 1, 1980	100.0	102.8	101.8	100.0	102.8			
Felsont Oil Corp								
Balance Nov 1, 1980	8,075	1,336	9,411	6,729	2,682	From Nov 1 To Date	0	861
April 1, 1981	8,075	475	8,550	6,729	1,821			
Percent of Nov 1, 1980	100.0	35.6	90.9	100.0	67.9			
Oklahoma Natural Gas Co								
Balance Nov 1, 1980	84,040	39,634	123,674	5,225	118,449	From Nov 1 To Date	5,481	21,939
April 1, 1981	84,040	23,176	107,216	5,225	101,991			
Percent of Nov 1, 1980	100.0	58.5	86.7	100.0	86.1			
Phillips Petroleum Co								
Balance Nov 1, 1980	1,623	2,246	3,869	352	3,517	From Nov 1 To Date	590	300
April 1, 1981	1,623	2,536	4,159	352	3,807			
Percent of Nov 1, 1980	100.0	112.9	107.5	100.0	108.2			
Independent Producer Total								
Balance Nov 1, 1980	130,433	108,605	239,037	47,044	191,993	From Nov 1 To Date	12,612	30,856
April 1, 1981	130,433	90,360	220,793	47,044	173,749			
Percent of Nov 1, 1980	100.0	83.2	92.4	100.0	90.5			
Total All Companies								
Balance Nov 1, 1980	2,372,913	2,144,761	4,517,667	627,919	3,889,748	From Nov 1 To Date	184,368	1,279,106
April 1, 1981	2,371,106	1,051,812	3,422,910	628,005	2,794,905			
Percent of Nov 1, 1980	99.9	49.0	75.8	100.0	71.9			

¹ Includes gas of co-owners in storage: Tennessee Gas Pipeline Co., Texas Eastern Transmission Corp., and Transcontinental Gas Pipeline Corp.

² Includes gas of co-owners in storage: North Penn Gas Corp., Tennessee Gas Pipeline Co., and Transcontinental Gas Pipeline Corp.

³ Includes gas of co-owners in storage: The Washington Power Co., and Northeast Pipeline Corp.

⁴ Includes gas of co-owner in storage: Arkansas Louisiana Gas Co.

Table 9. Natural Gas in Underground Storage, Injections and Withdrawals, as Reported in FPC Form 8 as of April 1, 1981
Total Gas in Storage Owned by Reporting Companies

(Volume in Million Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Area Company Name	Base Gas	Working Gas	Total Gas in Storage (Includes Native Gas)	Native Gas Included in Base Gas	Total Gas in Storage (Includes Native Gas)		Injections	Withdrawals
Eastern Area								
Columbia Gas Trans Corp								
Balance Nov 1, 1980	450,019	242,856	692,875	79,341	613,534	From Nov 1		
April 1, 1981	444,134	52,313	496,447	79,341	417,106	To Date	14,870	211,098
Percent of Nov 1, 1980	98.7	21.5	71.7	100.0	68.0			
Consolidated G Supply Corp								
Balance Nov 1, 1980	248,821	102,235	351,056	13,302	337,754	From Nov 1		
April 1, 1981	248,821	27,703	276,524	13,302	263,222	To Date	17,139	91,671
Percent of Nov 1, 1980	100.0	27.1	78.8	100.0	77.9			
Equitable Gas Co								
Balance Nov 1, 1980	26,467	25,093	51,560	1,846	49,714	From Nov 1		
April 1, 1981	26,467	5,887	32,354	1,846	30,508	To Date	1,614	20,820
Percent of Nov 1, 1980	100.0	23.5	62.8	100.0	61.4			
Hampshire Gas Company								
Balance Nov 1, 1980	9,393	0	9,393	9,393	0	From Nov 1		
April 1, 1981	9,393	0	9,393	9,393	0	To Date	0	0
Percent of Nov 1, 1980	100.0	.0	100.0	100.0	.0			
Honeye Storage Corp								
Balance Nov 1, 1980	257	0	257	141	116	From Nov 1		
April 1, 1981	257	0	257	141	116	To Date	0	0
Percent of Nov 1, 1980	100.0	.0	100.0	100.0	100.0			
National Fuel Gas Supply C								
Balance Nov 1, 1980	66,055	40,048	106,103	12,012	94,091	From Nov 1		
April 1, 1981	66,055	5,541	71,596	12,012	59,584	To Date	4,596	39,104
Percent of Nov 1, 1980	100.0	13.8	67.5	100.0	63.3			
North Penn Gas Co								
Balance Nov 1, 1980	7,500	11,109	18,609	0	18,609	From Nov 1		
April 1, 1981	7,500	3,404	10,904	0	10,904	To Date	0	7,705
Percent of Nov 1, 1980	100.0	30.6	58.6	.0	58.6			
Texas Eastern Trans Corp								
Balance Nov 1, 1980	98,575	55,642	154,218	32,456	121,762	From Nov 1		
April 1, 1981	98,575	6,305	104,881	32,456	72,425	To Date	6,519	55,856
Percent of Nov 1, 1980	100.0	11.3	68.0	100.0	59.5			
Transcontinental G & L Cor								
Balance Nov 1, 1980	96,515	18,826	115,340	25,385	89,955	From Nov 1		
April 1, 1981	96,515	14,510	111,024	25,385	85,639	To Date	2,447	6,764
Percent of Nov 1, 1980	100.0	77.1	96.3	100.0	95.2			
Eastern Area Total								
Balance Nov 1, 1980	1,003,602	495,809	1,499,411	173,876	1,325,535	From Nov 1		
April 1, 1981	997,917	115,663	1,113,580	173,876	939,704	To Date	47,185	431,018
Percent of Nov 1, 1980	99.4	23.3	74.3	100.0	70.9			

Table 9. Natural Gas in Underground Storage, Injections and Withdrawals, as Reported in FPC Form 8 as of April 1, 1981
Total Gas in Storage Owned by Reporting Companies--Continued

(Volume in Million Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Area Company Name	Base Gas	Working Gas	Total Gas in Storage (Includes Native Gas)	Native Gas Included in Base Gas	Total Gas in Storage (Excludes Native Gas)		Injections	Withdrawals
Midwestern Area								
Cities Service Gas Co								
Balance Nov 1, 1980	94,484	59,395	153,879	10,812	143,067	From Nov 1		
April 1, 1981	94,484	18,564	113,048	10,812	102,236	To Date	11,706	52,537
Percent of Nov 1, 1980	100.0	31.3	73.5	100.0	71.5			
Kansas Nebraska Nat Gas Co								
Balance Nov 1, 1980	32,359	58,755	91,114	27,805	63,309	From Nov 1		
April 1, 1981	32,359	58,982	91,341	27,805	63,536	To Date	858	641
Percent of Nov 1, 1980	100.0	100.4	100.2	100.0	100.4			
Michigan Gas Storage Co								
Balance Nov 1, 1980	71,000	40,373	111,373	55,500	55,873	From Nov 1		
April 1, 1981	71,000	11,024	82,024	55,500	26,524	To Date	0	29,349
Percent of Nov 1, 1980	100.0	27.3	73.6	100.0	47.5			
Michigan Wis Pipe Line Co								
Balance Nov 1, 1980	27,006	141,739	168,745	18,380	150,365	From Nov 1		
April 1, 1981	27,103	72,231	99,334	18,478	80,856	To Date	98	69,508
Percent of Nov 1, 1980	100.4	51.0	58.9	100.5	53.8			
Midwestern Gas Trans Co								
Balance Nov 1, 1980	15,900	366	16,266	0	16,266	From Nov 1		
April 1, 1981	15,900	-242	15,658	0	15,658	To Date	11	618
Percent of Nov 1, 1980	100.0	66.1	96.3	.0	96.3			
Miss River Trans Corp								
Balance Nov 1, 1980	54,080	27,632	81,712	15,803	65,909	From Nov 1		
April 1, 1981	54,080	1,139	55,219	15,803	39,416	To Date	1,484	27,977
Percent of Nov 1, 1980	100.0	4.1	67.6	100.0	59.8			
Natural Gas F L Co of Amer								
Balance Nov 1, 1980	156,299	281,133	437,432	12,574	424,858	From Nov 1		
April 1, 1981	156,299	186,616	342,915	12,574	330,341	To Date	4,372	98,889
Percent of Nov 1, 1980	100.0	66.4	78.4	100.0	77.8			
Northern Natural Gas Co								
Balance Nov 1, 1980	133,100	67,469	200,569	6,000	194,569	From Nov 1		
April 1, 1981	133,100	4,721	137,821	6,000	131,821	To Date	4,409	67,158
Percent of Nov 1, 1980	100.0	7.0	68.7	100.0	67.8			
Pashandle Eastern F L Co								
Balance Nov 1, 1980	73,850	29,751	103,601	12,062	91,539	From Nov 1		
April 1, 1981	74,863	6,058	80,920	12,062	68,858	To Date	3,321	26,002
Percent of Nov 1, 1980	101.4	20.4	78.1	100.0	75.2			
Texas Gas Transmission Cor								
Balance Nov 1, 1980	88,672	79,971	168,643	72,709	95,934	From Nov 1		
April 1, 1981	88,672	35,440	124,112	72,709	51,403	To Date	5,092	49,623
Percent of Nov 1, 1980	100.0	44.3	73.6	100.0	53.6			
Union Gas System Inc								
Balance Nov 1, 1980	1,019	4,511	5,530	0	5,530	From Nov 1		
April 1, 1981	1,019	3,497	4,516	0	4,516	To Date	13	1,027
Percent of Nov 1, 1980	100.0	77.5	81.7	.0	81.7			
Union Lt Heat and Power Co								
Balance Nov 1, 1980	550	379	929	0	929	From Nov 1		
April 1, 1981	550	380	930	0	930	To Date	19	18
Percent of Nov 1, 1980	100.0	100.3	100.1	.0	100.1			
Midwestern Area Total								
Balance Nov 1, 1980	748,319	791,474	1,539,793	231,645	1,308,148	From Nov 1		
April 1, 1981	749,429	398,410	1,147,838	231,743	916,095	To Date	31,393	423,347
Percent of Nov 1, 1980	100.1	50.3	74.5	100.0	70.0			

Table 9. Natural Gas in Underground Storage, Injections and Withdrawals, as Reported in FPC Form 8 as of April 1, 1981
Total Gas in Storage Owned by Reporting Companies--continued

(Volume in Million Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Area Company Name	Base Gas	Working Gas	Total Gas in Storage (Includes Native Gas)	Native Gas Included in Base Gas	Total Gas in Storage (Excludes Native Gas)		Injections	Withdrawals
Western Area								
Colo Interstate Gas Co								
Balance Nov 1, 1980	85,449	26,133	71,582	20,729	50,853	From Nov 1		
April 1, 1981	85,449	7,470	52,919	20,727	32,192	To Date	3,116	21,780
Percent of Nov 1, 1980	100.0	28.6	73.9	100.0	63.3			
El Paso Natural Gas Co								
Balance Nov 1, 1980	18,600	0	18,594	11,700	2,894	From Nov 1		
April 1, 1981	18,600	0	18,594	11,700	2,894	To Date	0	0
Percent of Nov 1, 1980	100.0	.0	100.0	100.0	100.0			
Lone Star Gas Co								
Balance Nov 1, 1980	26,731	46,339	73,070	10,403	62,667	From Nov 1		
April 1, 1981	26,731	38,138	64,869	10,403	54,466	To Date	11,115	19,316
Percent of Nov 1, 1980	100.0	82.3	88.8	100.0	86.9			
Montana Dakota Utilities C								
Balance Nov 1, 1980	23,222	132,337	155,558	23,222	132,336	From Nov 1		
April 1, 1981	23,222	128,606	151,828	23,222	128,606	To Date	4,812	7,743
Percent of Nov 1, 1980	100.0	97.2	97.6	100.0	97.2			
Mountain Fuel Resources								
Balance Nov 1, 1980	0	0	0	0	0	From Nov 1		
April 1, 1981	0	0	0	0	0	To Date	0	0
Percent of Nov 1, 1980	.0	.0	.0	.0	.0			
Mountain Fuel Supply Co								
Balance Nov 1, 1980	5,370	7,674	13,044	0	13,044	From Nov 1		
April 1, 1981	5,370	5,617	10,987	0	10,987	To Date	1,069	3,126
Percent of Nov 1, 1980	100.0	73.2	84.2	.0	84.2			
Washington Natural Gas Co								
Balance Nov 1, 1980	7,000	0	7,000	0	7,000	From Nov 1		
April 1, 1981	7,000	0	7,000	0	7,000	To Date	0	0
Percent of Nov 1, 1980	100.0	.0	100.0	.0	100.0			
Western Area Total								
Balance Nov 1, 1980	122,372	212,483	334,844	66,054	268,794	From Nov 1		
April 1, 1981	122,372	179,831	302,197	66,052	236,145	To Date	19,312	51,965
Percent of Nov 1, 1980	100.0	84.6	90.2	100.0	87.9			

Table 9. Natural Gas in Underground Storage, Injections and Withdrawals, as Reported in FPC Form 8 as of April 1, 1981
Total Gas in Storage Owned by Reporting Companies--Continued

(Volume in Billion Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Area Company Name	Base Gas	Working Gas	Total Gas in Storage (Includes Native Gas)	Native Gas Included in Base Gas	Total Gas in Storage (Excludes Native Gas)		Injections	Withdrawals

Southern Area								
Arkansas Louisiana Gas Co								
Balance Nov 1, 1980	41,274	18,237	59,511	16,432	43,079	From Nov 1 To Date	5,462	17,002
April 1, 1981	43,949	3,222	47,171	16,432	30,739			
Percent of Nov 1, 1980	106.5	17.7	79.3	100.0	71.4			
Arkansas Oklahoma Gas Corp								
Balance Nov 1, 1980	0	0	0	0	0	From Nov 1 To Date	160	160
April 1, 1981	0	0	0	0	0			
Percent of Nov 1, 1980	.0	.0	.0	.0	.0			
Southern Natural Gas Co								
Balance Nov 1, 1980	40,820	59,759	100,579	26,823	73,756	From Nov 1 To Date	6,625	38,522
April 1, 1981	40,820	27,862	68,682	26,823	41,859			
Percent of Nov 1, 1980	100.0	46.6	68.3	100.0	56.8			
United Gas Pipe Line Co								
Balance Nov 1, 1980	65,524	81,206	146,730	18,000	128,730	From Nov 1 To Date	17,796	71,577
April 1, 1981	65,524	27,425	92,949	18,000	74,949			
Percent of Nov 1, 1980	100.0	33.8	63.3	100.0	58.2			
Southern Area Total								
Balance Nov 1, 1980	147,618	159,202	306,820	61,255	245,565	From Nov 1 To Date	30,043	128,061
April 1, 1981	150,293	58,509	208,802	61,255	147,547			
Percent of Nov 1, 1980	101.8	36.8	68.1	100.0	60.1			
Pipeline Total								
Balance Nov 1, 1980	2,021,911	1,658,968	3,680,872	532,830	3,148,042	From Nov 1 To Date	127,933	1,036,391
April 1, 1981	2,020,811	752,413	2,772,417	532,926	2,239,491			
Percent of Nov 1, 1980	99.9	45.4	75.3	100.0	71.1			

Table 9. Natural Gas in Underground Storage, Injections and Withdrawals, as Reported in FPC Form 8 as of April 1, 1981
Total Gas in Storage Owned by Reporting Companies--Continued

(Volume in Million Cubic Feet at 14.73 psia and 60 Degrees Fahrenheit)

Area Company Name	Base Gas	Working Gas	Total Gas in Storage (Includes Native Gas)	Native Gas Included in Base Gas	Total Gas in Storage (Excludes Native Gas)		Injections	Withdrawals
Independent Producers								
Cabot Corporation								
Balance Nov 1, 1980	2,100	3,990	6,090	143	5,947	From Nov 1		
April 1, 1981	2,100	1,075	3,175	143	3,032	To Date	21	2,936
Percent of Nov 1, 1980	100.0	26.9	52.1	100.0	51.0			
Exxon Corporation								
Balance Nov 1, 1980	34,595	61,399	95,993	34,595	61,398	From Nov 1		
April 1, 1981	34,595	63,098	97,693	34,595	63,098	To Date	6,520	4,820
Percent of Nov 1, 1980	100.0	182.8	101.8	100.0	102.8			
Felsont Oil Corp								
Balance Nov 1, 1980	8,075	1,336	9,411	6,729	2,682	From Nov 1		
April 1, 1981	8,075	475	8,550	6,729	1,821	To Date	0	861
Percent of Nov 1, 1980	100.0	35.6	90.9	100.0	67.9			
Oklahoma Natural Gas Co								
Balance Nov 1, 1980	90,007	47,406	137,414	9,011	128,403	From Nov 1		
April 1, 1981	90,007	30,510	120,517	9,011	111,506	To Date	5,543	22,440
Percent of Nov 1, 1980	100.0	64.4	87.7	100.0	86.8			
Phillips Petroleum Co								
Balance Nov 1, 1980	893	1,150	2,043	184	1,859	From Nov 1		
April 1, 1981	893	850	1,743	184	1,559	To Date	0	300
Percent of Nov 1, 1980	100.0	73.9	85.3	100.0	83.9			
Independent Producer Total								
Balance Nov 1, 1980	135,670	115,281	250,951	50,662	200,289	From Nov 1		
April 1, 1981	135,670	96,008	231,678	50,662	181,016	To Date	12,084	31,357
Percent of Nov 1, 1980	100.0	83.3	92.3	100.0	90.4			
Total All Companies								
Balance Nov 1, 1980	2,157,581	1,774,249	3,931,830	583,692	3,348,138	From Nov 1		
April 1, 1981	2,155,681	848,421	3,004,095	583,588	2,420,507	To Date	140,017	1,067,748
Percent of Nov 1, 1980	99.9	47.8	76.4	100.0	72.3			

Table 10. Comparison of Total Gas Withdrawn from Storage by Pipeline Companies, 1977-1978, 1978-1979, 1979-1980, and 1980-1981 Winter Heating Seasons by Area (Million Cubic Feet--14.73 psia and 60 Degrees Fahrenheit)

Area	1977-1978	1978-1979	1979-1980	1980-1981
<u>Withdrawals from Storage</u>				
Eastern	760,052	644,618	587,614	624,671
Percent Change ¹	17.7	-15.2	-8.8	6.3
Midwestern	501,692	486,650	451,021	466,132
Percent Change ¹	19.5	-3.0	-7.3	3.4
Western	70,251	97,973	82,552	60,734
Percent Change ¹	13.8	39.5	-15.7	-26.4
Southern	109,167	109,280	92,649	96,713
Percent Change ¹	4.7	.1	-15.2	4.4
Total (All Areas)	1,441,162	1,338,521	1,213,836	1,248,250
Percent Change ¹ (All Areas)	17.0	-7.1	-9.3	-2.8
<u>Net Withdrawals from Storage</u>				
Eastern	701,922	560,967	526,785	554,172
Percent Change ¹	33.6	-20.1	-6.1	5.2
Midwestern	430,171	437,526	393,216	411,936
Percent Change ¹	28.6	1.7	-6.1	4.8
Western	45,019	83,194	66,040	40,470
Percent Change ¹	10.9	84.8	-20.6	-38.7
Southern	86,693	89,076	70,286	69,936
Percent Change ¹	18.1	2.7	-21.2	-0.5
Total (All Areas)	1,263,805	1,170,763	1,056,327	1,076,514
Percent Change ¹ (All Areas)	29.8	7.4	-9.8	1.9

¹ Comparison with previous heating season
Source: FPC Form 8, "Underground Storage Report."